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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/015,701
Filing Date: December 17, 2001
Appellant(s): KIM, KYEONG JIN

Eric J. Nuss
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 01 July 2010 appealing from the Office action mailed 06 January 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application: 1, 4, 5, 7, 9, 12-15, and 17-19.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

6,130,729	Oh	10-2000
6,573,965	Liu	06-2003
6,055,035	Von Gutfeld	04-2000
6,515,718	Kishimoto	02-2003
7,224,421	Takeda	05-2007
5,907,380	Lien	05-1999
5,511,591	Abe	04-1996
2001/0004281	Sasaki	06-2001
7,136,140	Inoue	11-2006

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1, 4, 5, 7, 9, and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh et al (Oh) USPAT 6,130,729 in view of Liu et al (Liu) USPAT 6,573,965 B1, Von Gutfeld et al (Von Gutfeld) USPAT 6,055,035, Kishimoto et al (Kishimoto) USPAT 6,515,718 B1, Takeda et al (Takeda) USPAT 7,224,421 B1, Lien USPAT 5,907,380, Abe USPAT 5,511,591, Sasaki USPGPUB 2001/0004281 and further in view of Inoue et al [Inoue] USPAT 7,136,140.

As to claims 1, 7, and 11, Ohe discloses (Abstract and entire patent) a method of forming a liquid crystal display device comprising: forming an L-shaped thin film transistor (Figure 3A, col. 6, lines 32-37) and a pixel electrode, 39, on a first substrate.

FIG. 3A

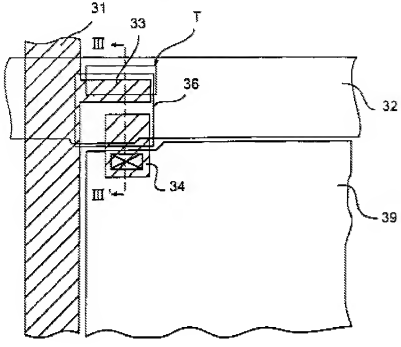
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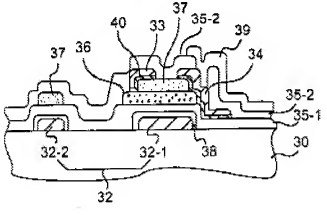
FIG. 3B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Ohe does not explicitly disclose forming a dielectric frame having a first height and a sealant having a second height on a second substrate, the first height of the dielectric frame being different from the second height of the sealant; dispensing liquid crystal on the first substrate; and attaching the first and second substrates to each other.

Liu teaches (Abstract and entire patent) forming bumps, 311 and 409 (Applicant's dielectric frame) on both substrates (Figure 5, col. 5, lines 45-57, and col. 5, lines 35-44) having a first height and a sealant having a second height (not shown) such that the sealant is taller than the dielectric frame as is evidenced by the gap between the dielectric frames and the opposed substrate (Figure 5) to comprise a multi-domain display with wide viewing angle (col. 2, lines 36-46).

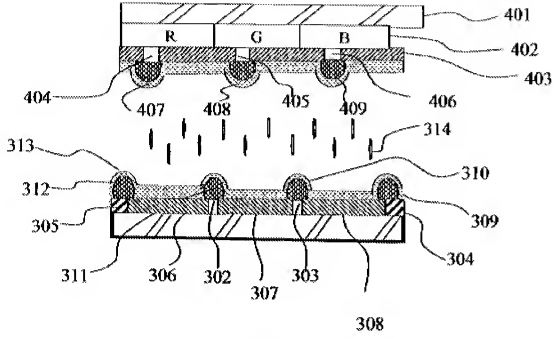


FIG. 5

Von Gutfeld teaches uniformly dispensing liquid crystal on discrete areas (pixel areas and non-pixel/non-display areas) of the first substrate (Abstract and entire patent); and attaching the first and second substrates to each other to provide a simplified and more efficient method for filling an unassembled LCD panel that is less costly (col. 2, lines 25-34) and Von Gutfeld, teaches that the sealant includes a material hardened by ultraviolet ray (col. 4, lines 1-4).

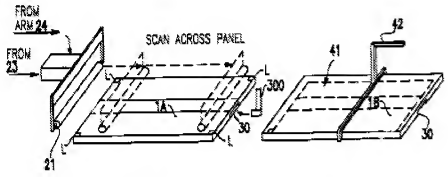


FIG.3 FIG.4

Liu is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a dielectric frame on both substrates having a first height and a sealant having a second height such that the sealant is taller than the dielectric frame to comprise a multi-domain display with wide viewing angle.

Von Gutfeld is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to dispense liquid crystal on the first substrate; and attach the first and second substrates to each other to provide a simplified and more efficient method for filling an unassembled LCD panel that is less costly.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Oh with the dielectric frame on both substrates having a first height and a sealant having a second height such that the sealant is taller than the dielectric frame of Liu to comprise a multi-domain display with wide viewing angle and to dispense liquid crystal on the first

substrate; and attach the first and second substrates to each other per Von Gutfeld to provide a simplified and more efficient method for filling an unassembled LCD panel that is less costly.

Oh, Liu, and Von Gutfeld do not explicitly disclose specific heights of dielectric structures with respect to seal heights wherein a height difference between the sealant and the dielectric frame is more than 1 μm or wherein the first height is a range of 1-2 μm and the second height is in a range of 5-8 μm.

Please note the motivations for establishing cell gap (and correspondingly seal height) were well known in the art at the time the claimed invention was made and include optimization of voltage required, retarder value of liquid crystal layer, and control of liquid crystal mode or configuration.

Kishimoto discloses the motivation to optimize the height of a dielectric structure is to account for the relative dielectric constants of the respective components (col. 18, lines 21-23). In other words, the height is made sufficient to achieve the desired dielectric effect given the relative dielectric strength of the material used.

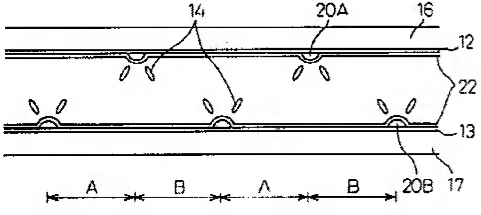
Kishimoto is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to optimize the results effective variables of relative dielectric frame height and seal height to achieve the desired dielectric effect given the relative dielectric strength of the material used.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Oh, Liu, and Von

Gutfeld with the specific heights of dielectric structures with respect to seal heights wherein a height difference between the sealant and the dielectric frame is more than 1 μm or wherein the first height is a range of 1-2 μm and the second height is in a range of 5-8 μm of Kishimoto to achieve the desired dielectric effect given the relative dielectric strength of the material used (MPEP 2144.05, II, B).

Takeda teaches numerous embodiments, at least one of which uses of 1.5 μm protrusions [Applicant's dielectric frames] in a cell with thickness 3.5 μm [col. 24, line 32 through col. 25, line 5] in order to achieve good mulit-domain performance with fast switching [enough dielectric frame hight for good muli-domain performance for good viewing angle performance plus enough sealant height (obviously needed) to bridge the 3.5 μm gap to allow unobstructed liquid crystal movement for fast switching speed].

Fig.100A



Takeda is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to optimize the results effective variables of

relative dielectric frame height and seal height to achieve the desired dielectric effect given the relative dielectric strength of the material used.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Oh, Liu, Von Gutfeld and with the specific heights of dielectric structures with respect to seal heights wherein a height difference between the sealant and the dielectric frame is more than 1 μm or wherein the first height is a range of 1.5 μm and the second height is in a range of greater than 3.5 μm of Takeda to achieve the desired dielectric effect given the relative dielectric strength of the material used (MPEP 2144.05, II, B) and fast switching.

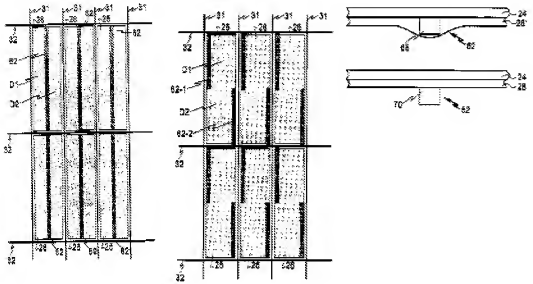
Please note that limitations of: "... the height difference between the sealant structure and dielectric frame allows the dispensed liquid crystal to be uniformly distributed on the first substrate." and "dispensing liquid crystal on the first substrate where the dielectric frame is not formed, wherein the dispensed liquid crystal moves and is uniformly distributed on the first substrate;" are considered met by the prior art as applied.

The height difference between the sealant structure and dielectric frame allows the dispensed liquid crystal to be uniformly distributed on the first substrate, since the liquid crystal is liquid and it does ultimately move to become a uniform layer between to substantially parallel substrates [inherently required to comprise a functional LCD]. Please also note that Applicant's specification does not support the specific step of movement of the liquid crystal subsequent to dispensing and prior to mating the

substrates, although one of ordinary skill in the art would realize that a liquid will inherently flow to at least some extent due to gravity. Examiner considered specification [0052] and [0056], but must rely on ordinary skill in the art to glean movement of the liquid crystal subsequent to dispensing and prior to mating the substrates.

As to limitations of "the first height of the dielectric frame is such that the dielectric frame provides a sufficient electric field distortion for a multi-domain effect." are considered met in view of the teachings as to creating a multi-domain effect, above.

Lien teaches the use of 'XP-9595' Photoimageable LCD Top Coat, which contains an acrylic copolymer [Applicant's photoacrylate], available from Shipley Co. of Marlborough, Massachusetts [col. 5, lines 40-64] as an art recognized material suitable for the same purpose of forming dielectric structures in LCDs that produce multi-domain effects [MPEP 2144.07].



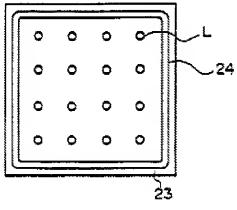
Lien is evidence that workers of ordinary skill in the art would find the reason, suggestion, or motivation to add dielectric frames made of 'XP-9595' Photoimageable LCD Top Coat, which contains an acrylic copolymer [Applicant's photoacrylate], available from Shipley Co. of Marlborough, Massachusetts [col. 5, lines 40-64] as an art recognized material suitable for the same purpose of forming dielectric structures in LCDs that produce multi-domain effects [MPEP 2144.07].

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Oh with the dielectric frames made of 'XP-9595' Photoimageable LCD Top Coat, which contains an acrylic copolymer [Applicant's photoacrylate], available from Shipley Co. of Marlborough, Massachusetts [col. 5, lines 40-64] as an art recognized material suitable for the same purpose of forming dielectric structures in LCDs that produce multi-domain effects [MPEP 2144.07].

Please note Applicant's limitation as to "prevent the generation of bubbles in the liquid crystal" is considered an intended use limitation that adds little to the method step limitations. Clearly most all LCDs must be bubble free to work properly, so clearly it is obvious to one of ordinary skill to use sufficient seal height to prevent introduction of air bubbles into the LCD.

As to newly added limitations regarding a plurality of droplets, Abe teaches the use of a plurality of droplets, L, as a means of greatly improving productivity by reducing the amount of time required for liquid crystal fill [col. 8, line 37 through col. 9, line 22].

FIG. 9



Abe is evidence that workers of ordinary skill in the art would find the reason, suggestion, or motivation to add the step of dispensing a plurality of droplets spaced with each other to greatly improve productivity.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention with a plurality of droplets spaced with each other of Abe to greatly improve productivity. This method step is also

rendered obvious as an art recognized means suitable for the intended purpose of depositing liquid crystal material [MPEP 2144.07].

As to limitations regarding a plurality of droplets and heights that do not hinder the dispersed liquid crystal from being moved and uniformly distributed, examiner considers these limitations are met by the prior art as applied (and by most any known LCD method of manufacture) since the liquid crystal is liquid and it does ultimately move to become a uniform layer between to substantially parallel substrates [inherently required to comprise a functional LCD], and the resulting liquid crystal layer covers where the dielectric frame is not formed; it is not reasonable to consider application of liquid crystal material only on the areas where the dielectric frames are not formed without any liquid crystal getting on the dielectric frames because a droplet of liquid crystal is well known to be larger than a sub-pixel [not enabled]. Also, it is not at all clear [not at all enabled] how the height of the sealant around the perimeter has anything at all to do with movement of the liquid crystal subsequent to dispensing and prior to mating the substrates. The height difference seems only relevant to liquid crystal movement during completed LCD operation, e.g., switching, and that is not at all relevant to liquid crystal distribution during a method of making a display device.

Please again note that Applicant's specification does not support the specific step of movement of the liquid crystal subsequent to dispensing and prior to mating the substrates. Examiner considered specification [0052] and [0056], but must rely on ordinary skill in the art to glean movement of the liquid crystal subsequent to dispensing and prior to mating the substrates.

Regarding limitations wherein the second height of the sealant structure is proportional to the first height of the dielectric frame, this is considered met because the second height, SH, will inherently be SH/FH * FH, which is proportional.

The above do not explicitly teach completely hardening the sealant structure under no pressure.

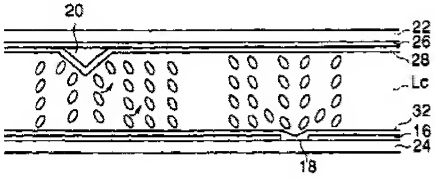
Sasaki teaches the use of multiple sealants whereby one may harden one sealant in the vacuum and harden the second sealant after removal of the vacuum (i.e., after restoration to atmospheric pressure) in order to better control cell gap [0039] and [0090] to [0093].

Sasaki is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to cure a sealant under no pressure to better control cell gap [0039] and [0090] to [0093].

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the method with the step of curing a sealant under no pressure to better control cell gap [0039] and [0090] to [0093].

As to limitations regarding dispensing liquid crystal on the first substrate having no dielectric frame, Inoue teaches [e.g., Figure 33c and associated text] a number of display embodiments with various configurations of dielectric frames and windows as art recognized configurations of dielectric frames and windows suitable for the intended purpose of controlling liquid crystal domain alignment [MPEP 2144.07].

FIG. 33c



Inoue is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use a substrate with dielectric frames on the color filter side and a substrate with windows [gaps, slits, etc.] on the TFT side [onto which the liquid crystal is applied] as an art recognized configuration of dielectric frames and windows suitable for the intended purpose of controlling liquid crystal domain alignment [MPEP 2144.07].

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the method with a substrate with dielectric frames on the color filter side and a substrate with windows [gaps, slits, etc.] on the TFT side [onto which the liquid crystal is applied] as an art recognized configuration of dielectric frames and windows suitable for the intended purpose of controlling liquid crystal domain alignment [MPEP 2144.07].

Please note that Inoue teaches pretty much all basic arrangements of dielectric frames and windows [on one side, on both sides, one type on each side, etc.], so this is considered to render applicant's particular arrangement obvious to those of ordinary

skill at the time the claimed invention was made. The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

As to claim 4 Liu, as combined above, teaches a method further comprising forming electric field inducing slits, 302 and 303 (Applicant's windows), in the pixel electrode, 306~308.

As to claim 5, Liu, as combined above, teaches in Figure 2 a method wherein the electric field inducing window has a slit shape.

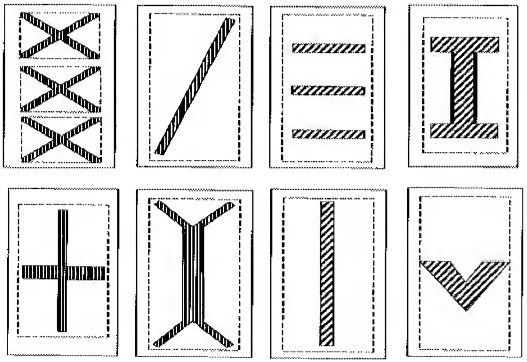


FIG. 2

As to claim 9, Liu, as combined above, teaches Prior Art in Figure 1 that shows dielectric frames drive the liquid crystal in various directions.

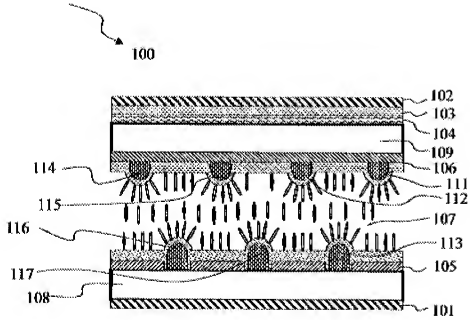


FIG. 1 (Prior Art)

As to claim 12, Oh, as combined above, discloses a method further comprising forming a common electrode on the second substrate (required element, not shown).

As to claim 13, Liu, as combined above, teaches a method wherein the dielectric frame, 409, is formed on the common electrode, 403 (Figure 5).

As to claim 14, Liu, as combined above, teaches a method further comprising forming an alignment layer, 313 and 407, on the first and second substrates (Figure 5).

2. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oh, Liu, Von Gutfeld, Kishimoto, Takeda, Lien, Abe, Sasaki, and Inoue, as applied to claims above, in view of Tanaka et al (Tanaka) USPAT 6,603,528 B1.

As to claim 15, Oh, Liu, and Von Gutfeld disclose the method of claim 14.

Oh, Liu, and Von Gutfeld do not explicitly disclose a method wherein the alignment layer is selected from the group consisting of polyimide, polyamide, polyvinyl alcohol, polyamic acid, and silicon oxide.

Tanaka teaches the use of polyimide as an art recognized material suitable for the intended purpose of forming an alignment film for liquid crystal displays (col. 9, lines 5-21).

Tanaka is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use polyimide as an art recognized material suitable for the intended purpose of forming an alignment film for liquid crystal displays.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Oh, Liu, and Von Gutfeld with the polyimide alignment layer of Tanaka as an art recognized material suitable for the intended purpose of forming an alignment film for liquid crystal displays (MPEP 2144.07).

3. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh, Liu, Von Gutfeld, Kishimoto, Takeda, Lien, Abe, Sasaki, Inoue, as applied to claims above, in view of Kim et al (Kim) USPAT 6,100,953.

As to claims 17-19, Oh, Liu, and Von Gutfeld disclose the method of claim 14.

Oh, Liu, and Von Gutfeld do not explicitly disclose a method comprising formation of a phase difference film, negative uniaxial, or negative biaxial.

Kim teaches the use of negative uniaxial and negative biaxial phase compensation films (Applicant's phase difference films) as suitable means of improving viewing angle performance (col. 5, line 66, through col. 6, line 12).

Kim is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add negative uniaxial and negative biaxial phase difference films as suitable means of improving viewing angle performance.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Oh, Liu, and Von Gutfeld with the negative uniaxial and negative biaxial phase difference films of Kim as suitable means of improving viewing angle performance.

(10) Response to Argument

Argument: At page 8, Appellant argues the applied combination of prior art does not teach every element of independent claim 1.

Response: It is respectfully pointed out the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Also, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Please note there are few possible species of liquid crystal dropping method as it pertains to dropping liquid crystal onto the first substrate or the second substrate; there are only two possibilities, so both are rendered obvious by the teachings of the applied prior art.

Please note there are few possible species of liquid crystal dropping method as it pertains to dropping liquid crystal onto a substrate with or without a dielectric frame; there are only two possibilities, both will work although one may work better than the other, so both are rendered obvious by the applied prior art per rejections that appear in the Final Rejection mailed 06 January 2010.

Argument: At page 9 (middle), Appellant argues a number of specific limitations are not met by the applied combination of prior art.

Response: It is respectfully pointed out each limitation is addressed properly in the Final Rejection. Please note, an obviousness rejection is not a "multi-reference 102 rejection".

It is respectfully pointed out the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Also, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In each case of argued limitation, strong evidence exists for each limitation being well known in the art as part of a species of method. Numerous combinations of method step specifics (species) are rendered obvious by the substantial applied combination of prior art teachings, including those as presently broadly claimed by Appellant. In many cases, there are few possibilities, e.g., there are few possible

species of liquid crystal dropping method as it pertains to dropping liquid crystal onto the first substrate or the second substrate; there are only two possibilities, so both are rendered obvious by the teachings of the applied prior art.

Also, there are few possible species of liquid crystal dropping method as it pertains to dropping liquid crystal onto a substrate with or without a dielectric frame; there are only two possibilities, both will work although one may work better than the other, so both are rendered obvious by the applied prior art per rejections that appear in the Final Rejection mailed 06 January 2010.

Argument: At page 9 (bottom), Appellant argues the claimed sealant height that is more than 1 μm greater than the dielectric frame height is not rendered obvious by the applied prior art.

Response: It is respectfully pointed out that probably no prior art uses a sealant height that is NOT more than 1 μm greater than the dielectric frame height. All prior art found had sealant heights that are understood to be substantially taller than the dielectric frame height based upon Figures and associated text.

However, on point, this limitation was rejected on page 10 of the Final Rejection mailed 06 January 2010. Takeda teaches a cell thickness of 3.5 μm [which sets the needed sealant height that must traverse the cell gap in order to seal in the liquid] and Takeda teaches protrusions [dielectric frames] of 1.5 μm, so 3.5 - 1.5 is greater than 1. Appellant's claimed limitation is clearly met by properly combined Takeda.

Argument: At page 10, Appellant argues more limitations.

Response: It is respectfully pointed out each limitation is addressed properly in the Final Rejection. Please note, an obviousness rejection is not a "multi-reference 102 rejection".

It is respectfully pointed out the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Also, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., qualitative argument as to the time required for the liquid crystal to spread out over the substrate) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In each case of argued limitation, strong evidence exists for each limitation being well known in the art as part of a species of method. Numerous combinations of method step specifics (species) are rendered obvious by the substantial applied combination of prior art teachings, including those as presently broadly claimed by Appellant. In many cases, there are few possibilities, e.g., there are few possible species of liquid crystal dropping method as it pertains to dropping liquid crystal onto the first substrate or the second substrate; there are only two possibilities, so both are rendered obvious by the teachings of the applied prior art.

Also, there are few possible species of liquid crystal dropping method as it pertains to dropping liquid crystal onto a substrate with or without a dielectric frame; there are only two possibilities, both will work although one may work better than the other, so both are rendered obvious by the applied prior art per rejections that appear in the Final Rejection mailed 06 January 2010.

Regarding bubbles, no production displays may have bubbles. All the applied references avoid bubble formation in order to produce displays of satisfactory display quality, and so bubble formation avoidance is rendered obvious to those of ordinary skill in the art of liquid crystal displays by the applied prior art per rejections that appear in the Final Rejection mailed 06 January 2010.

Lastly, a liquid will spread out due to gravity. Applicant has not claimed anything that is not rendered obvious to one of ordinary skill by the applied combination of prior art per rejections that appear in the Final Rejection mailed 06 January 2010.

Argument: At page 12 (top), Appellant argues limitations as to frame height and sealant height difference are not met.

Response: It is respectfully pointed out that probably no prior art uses a sealant height that is NOT more than 1 μm greater than the dielectric frame height. All prior art found had sealant heights that are understood to be substantially taller than the dielectric frame height based upon Figures and associated text.

However, on point, this limitation was rejected on page 10 of the Final Rejection mailed 06 January 2010. Takeda teaches a cell thickness of 3.5 μm [which sets the needed sealant height that must traverse the cell gap in order to seal in the liquid] and Takeda teaches protrusions [dielectric frames] of 1.5 μm, so 3.5 - 1.5 is greater than 1. Appellant's claimed limitation is clearly met by properly combined Takeda.

It is respectfully pointed out the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Also, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Argument: At page 12 (bottom), Appellant argues Kishimoto's results effective variable.

Response: It is respectfully pointed out a results effective variable is sufficient to render obvious the setting of the height of the dielectric frames to a height that will meet appellant's claimed height difference.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

It is respectfully pointed out that probably no prior art uses a sealant height that is NOT more than 1 μm greater than the dielectric frame height. All prior art found had sealant heights that are understood to be substantially taller than the dielectric frame height based upon Figures and associated text.

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Argument: At page 13, Appellant argues unclaimed "limitations".

Response: It is noted that the features upon which applicant relies (i.e., qualitative argument as to the time required for the liquid crystal to spread out over the substrate) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In each case of argued limitation, strong evidence exists for each limitation being well known in the art as part of a species of method. Numerous combinations of method step specifics (species) are rendered obvious by the substantial applied combination of prior art teachings, including those as presently broadly claimed by Appellant. In many cases, there are few possibilities, e.g., there are few possible species of liquid crystal dropping method as it pertains to dropping liquid crystal onto the first substrate or the second substrate; there are only two possibilities, so both are rendered obvious by the teachings of the applied prior art.

Also, there are few possible species of liquid crystal dropping method as it pertains to dropping liquid crystal onto a substrate with or without a dielectric frame; there are only two possibilities, both will work although one may work better than the other, so both are rendered obvious by the applied prior art per rejections that appear in the Final Rejection mailed 06 January 2010.

Regarding bubbles, no production displays may have bubbles. All the applied references avoid bubble formation in order to produce displays of satisfactory display quality, and so bubble formation avoidance is rendered obvious to those of ordinary skill in the art of liquid crystal displays by the applied prior art per rejections that appear in the Final Rejection mailed 06 January 2010.

Lastly, a liquid will eventually spread out due to gravity, and due to the application of the mating substrate (sandwiching); since the applied prior art had properly filled LCDs, the liquid obviously does (did) successfully spread out to form a bubble-free uniform layer in each applied prior art reference. Applicant has not claimed anything that is not rendered obvious to one of ordinary skill by the applied combination of prior art per rejections that appear in the Final Rejection mailed 06 January 2010.

Argument: At page 14, Appellant argues unclaimed "limitations" as to the speed of the method step(s).

Response: It is noted that the features upon which applicant relies (i.e., qualitative argument as to the time required for the liquid crystal to spread out over the

substrate) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In each case of argued limitation, strong evidence exists for each limitation being well known in the art as part of a species of method. Numerous combinations of method step specifics (species) are rendered obvious by the substantial applied combination of prior art teachings, including those as presently broadly claimed by Appellant.

Regarding bubbles, no production displays may have bubbles. All the applied references avoid bubble formation in order to produce displays of satisfactory display quality, and so bubble formation avoidance is rendered obvious to those of ordinary skill in the art of liquid crystal displays by the applied prior art per rejections that appear in the Final Rejection mailed 06 January 2010.

Lastly, a liquid will eventually spread out due to gravity, and due to the application of the mating substrate (sandwiching); since the applied prior art had properly filled LCDs, and the liquid crystal of the prior art obviously does (did) successfully spread out to form a bubble-free uniform layer in each applied prior art reference. Applicant has not claimed any limitation that is not rendered obvious to one of ordinary skill by the applied combination of prior art per rejections that appear in the Final Rejection mailed 06 January 2010.

Argument: At pages 15 and 16, Appellant argues dependent claims are allowable because the independent claim is allowable.

Response: It is respectfully pointed out the independent claim is not allowable per rejections mailed 06 January 2010.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/TIMOTHY RUDE/

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T-QAS TC 2800